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Hard work leads to national science fair

by Claire Eamer

Two young Whitehorse scientists have spent the past week in a flurry of scientific activity at the Canada-Wide Science Fair at the University of British Columbia (UBC) in Vancouver.

Besides matching their projects against those of students from all across the country, Malkolm Boothroyd and Craig Flaherty have had the chance to compete in Science Olympics at the UBC Aquatic Centre, watch dragon boat races, tour the university campus, meet scientists, and take part in a variety of field trips and social events.

Boothroyd, of Selkirk Elementary, and Flaherty, a student at Vanier Secondary, won their way to the Canada-Wide fair at the Yukon/Stikine Regional Science Fair last December.

Flaherty's winning project examined whether gender affects the accuracy of eyewitness reports. Boothroyd's project was entitled "The Factors Affecting Mycelia Growth."

What has happened to Boothroyd's project since last December is an example of the hard work involved in entering the Canada-Wide fair.

For one thing, it acquired a new title -- "Fun with Fungus: Factors Affecting Mushroom Growth."

"Something not so boring," the grade-seven student explained.

And Boothroyd has done a lot more research since last December.

His original experiment examined how access to air affects the growth of the mycelia of oyster mushrooms.

"Mushrooms are only a fruiting body of a larger organism," Boothroyd wrote in his project report. "Below the ground is a network of mycelia, the main part of the mushroom."

Oyster mushroom mycelia grow naturally on rotting trees, but they can also be grown indoors on straw.

"There are a few stages that must be done before the mycelia are added to straw," Boothroyd said. "Mycelia must be grown on millet, coffee grounds etc., then added to straw."

The young scientist's experiments were conducted with mycelia growing on boiled millet. His initial experiment, the one he reported on at last December's science fair, involved growing mycelia in containers, some of which had airtight lids and some perforated lids.

The mycelia grew at the same rate for eight days, no matter what kind of container they were in, Boothroyd reported. However, after day nine the mycelia in jars open to the air gained on the other jars, and by day 12 the mycelia in the airtight jars had stopped growing.

"I guessed that the mycelia stopped growing when the jars they grew in ran out of air."

For the national science fair, Boothroyd took his research several steps further. First, he duplicated his original experiment to the point where the mycelia in the closed jars stopped growing. Then he opened those jars to the air to see what would happen.

"When I exposed air to the mycelia in the jars previously closed to air, the mycelia began to grow again. This confirmed that air is essential to the growth of Oyster Mushrooms."

Next he tried to determine what chemicals might kill the mushrooms. Boothroyd tested bleach, borax, and a commercial cleaning solution on a fresh batch of oyster mushroom mycelia.

"I had read that bleach was toxic, so I assumed that it was bad for the environment, and therefore would kill the mycelia and mushrooms," Boothroyd said.

Much to his surprise, however, the mycelia seemed immune to bleach and the commercial cleaning solution, but susceptible to borax. That gave Boothroyd an idea for one more experiment.

Both bleach and the cleaning solution are acidic, whereas borax is basic, so Boothroyd decided to test the susceptibility of mycelia to acids and bases. This time he grew mycelia in the presence of vinegar (acid), water (neutral), and baking soda (base).

Neither baking soda nor vinegar killed or altered the growth of the mycelia, he reported, although the mycelia growing in water did best of all. However, he's not sure that the experiment is the final answer to his question. Boothroyd thinks the basic and acidic solutions might have been too weak to affect the mycelia to a measurable extent.

"If I were to conduct this experiment again I would try adding a larger dose of the substances, and adding a more concentrated dose of the substances."

But that experiment will have to wait for another science fair.

For information and results from the Canada-Wide Science Fair, go to www.cwsf2005.ca. For information about the Yukon/Stikine Regional Science Fair, contact Innovators in the Schools, innovators@yukoncollege.yk.ca.

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